AUSTRALIAN OPOSSUM SHRIMPS (MYSIDACEA)

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Text figs. 95-105.

In response to my request for Australian material belonging to this group of Crustacea, Mr. Edgar R. Waite, Director of the South Australian Museum at Adelaide, was good enough to submit to me for examination the small collection available in that Museum. Mr. Herbert M. Hale has kindly kept a special look out for specimens, and has forwarded from time to time additional material for examination. To both these gentlemen I am very much indebted for the trouble they have taken to obtain Mysids for me. As a result of their efforts I am able to record here ten species of the group from South Australian waters, of which no fewer than seven species are new to science.

I have included in this report records of specimens kindly given to me by the late Professor S. J. Johnston, of the University of Sydney, in 1914, and material collected by myself in Tasmania in the same year.

Practically no attention has been paid to the Mysidacea of Australia. No species are recorded in Haswell's catalogue. The Challenger Expedition collected three species in Port Phillip, all new to science, described by Sars under the following names, *Pseudomma australe*, *Anchialus angustus*, and *Mysidopsis incisa*. The only subsequent record of any species from Australia is by Zimmer (8), who described *Anisomysis australis* from Port Phillip. *Siriella thompsonii* (M. Edw.) has been recorded from Australian waters both by Sars (5) and Colosi (2), but as this is a widely distributed, truly oceanic species it can hardly be regarded as properly belonging to the Australian marine fauna.

The number of Australian species of Mysidacea hitherto known amounts, therefore, to four, and as these were all collected in the same locality, Port Phillip, some indication is given of the amount of work which still remains to be done before the Mysid fauna of Australia can be said to be at all adequately known. All but one of the known Australian species of Mysidacea, *Pseudomma australe*, are included in the small collection received from the South Australian Museum, so that this report may be considered as covering all that is at present known of the Mysidacea of these waters.

There is nothing very peculiar or distinctive about the Mysid fauna of Australia as revealed by the present collection. Its affinities, as far as can be gleaned from this material, lie with the Indian Ocean and Western Pacific fauna. The genera *Siriella, Leptomysis, Anisomysis,* and *Heteromysis* are represented in both areas, and the species are closely allied. The genera *Paranchialina* and *Australomysis* are so far peculiar to Australia.

The most striking fact in the collection is the absence of the genus *Tenagomysis,* which is so characteristic of New Zealand waters. Six species of the genus were collected off New Zealand in considerable quantities by the "Terra Nova" (Tattersall, 6), and altogether nine species of the genus are known, all from these seas; its absence from Australian waters is therefore somewhat remarkable.

FAMILY MYSIDAE.

SUB-FAMILY SIRIELLINAE.

SIRIELLA Dana.

This genus already includes a large number of species, but none of them has up to now been recorded from Australia, if we except the oceanic species, *S. thompsonii*, recorded by the "Challenger" on its voyage from Sydney to Wellington.

In the collection submitted to me by the South Australian Museum there are three species of this genus, all of which appear to be new to science. They may be distinguished by the following key:

1. Large; rostral plate hardly produced in the mid-dorsal line, but produced into prominent pointed shoulders over the eyes .. .. *halei* sp. nov.
2. Small; carapace not produced into shoulders over the eyes.
    (a) Rostral plate broadly rounded in the mid-dorsal line and hardly produced at all. Telson broadly linguiform in shape, with three pairs of spines on the apex. Sixth joint of the thoracic limbs undivided. Spines on inner uropod not in series .. *vincenti* sp. nov.
    (b) Rostral plate produced into an acute triangular plate. Telson narrowly linguiform in shape, with only two pairs of spines at apex. Sixth joint of the thoracic limbs divided into two sub-joints. Spines on inner uropod in series or groups .. *australis* sp. nov.

SIRIELLA HALEI, sp. nov.

Carapace short, leaving the last thoracic somite uncovered; front margin of the carapace hardly produced into a rostral plate, broadly rounded in the mid-dorsal line, produced into quite prominent shoulders over the outside margins of the eyes, these shoulders quite as long as and much more acute than the median rostral plate; antero-lateral corners of the carapace rounded. Below the median broadly rounded rostral plate is a prominent acute spine, forming a conspicuous pseudo-rostral process. *Eyes* of moderate size, shorter than the first joint of the antennular peduncle, one and two-thirds times as long as broad, cornea occupying the distal third of the eye, pigment black. *Antennular peduncle* with the first joint very nearly as long as the second and third combined; third joint twice as long as the second, with a row of nine or ten long, plumose setae on the inner

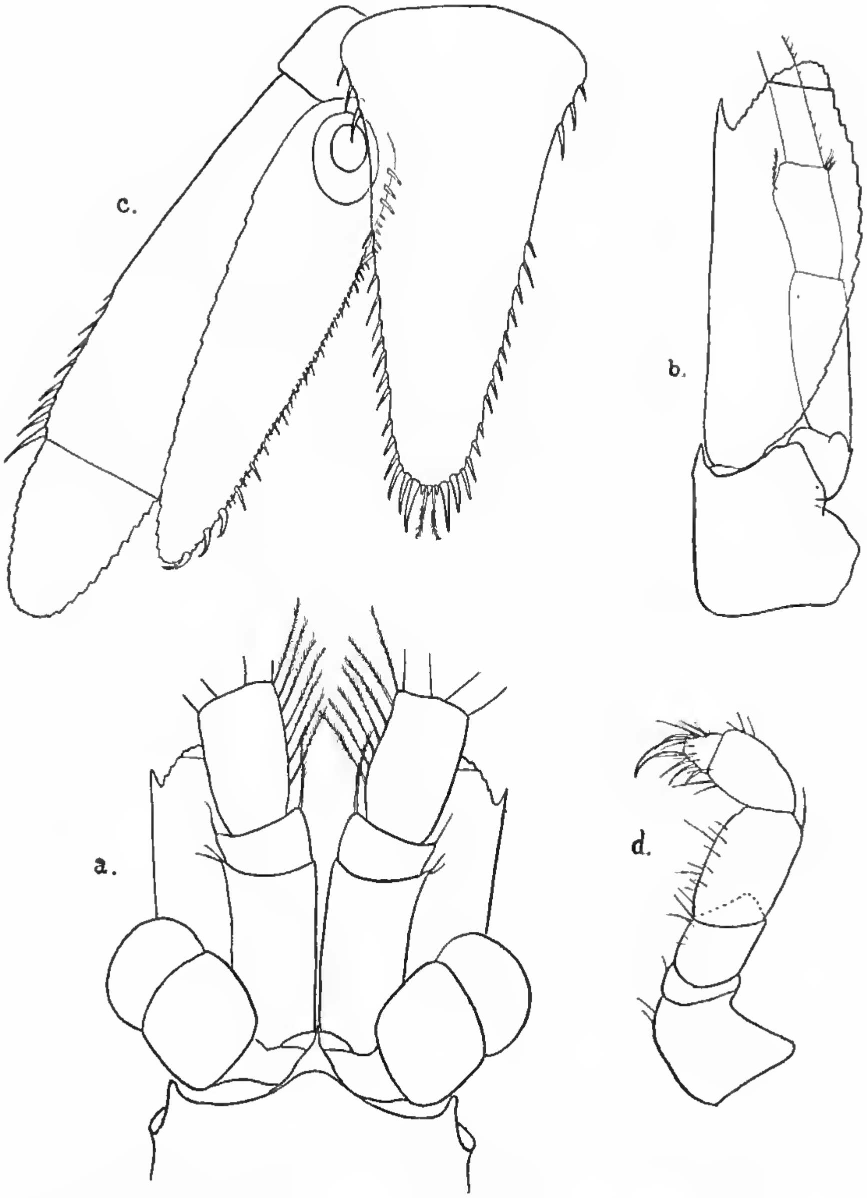

Fig. 95. *Siriella halei; a*, dorsal view of anterior end of female (32 diam.); *b*, antennal scale and peduncle (39 diam.); *c*, telson and uropod (39 diam.); *d*, endopod of first thoracic limb of female (39 diam.).

margin; a single long, plumose seta on the inner distal corner of the second joint. *Antennal scale* not extending quite so far forwards as the antennular peduncle, three times as long as broad, outer marginal spine very prominent, terminal lobe

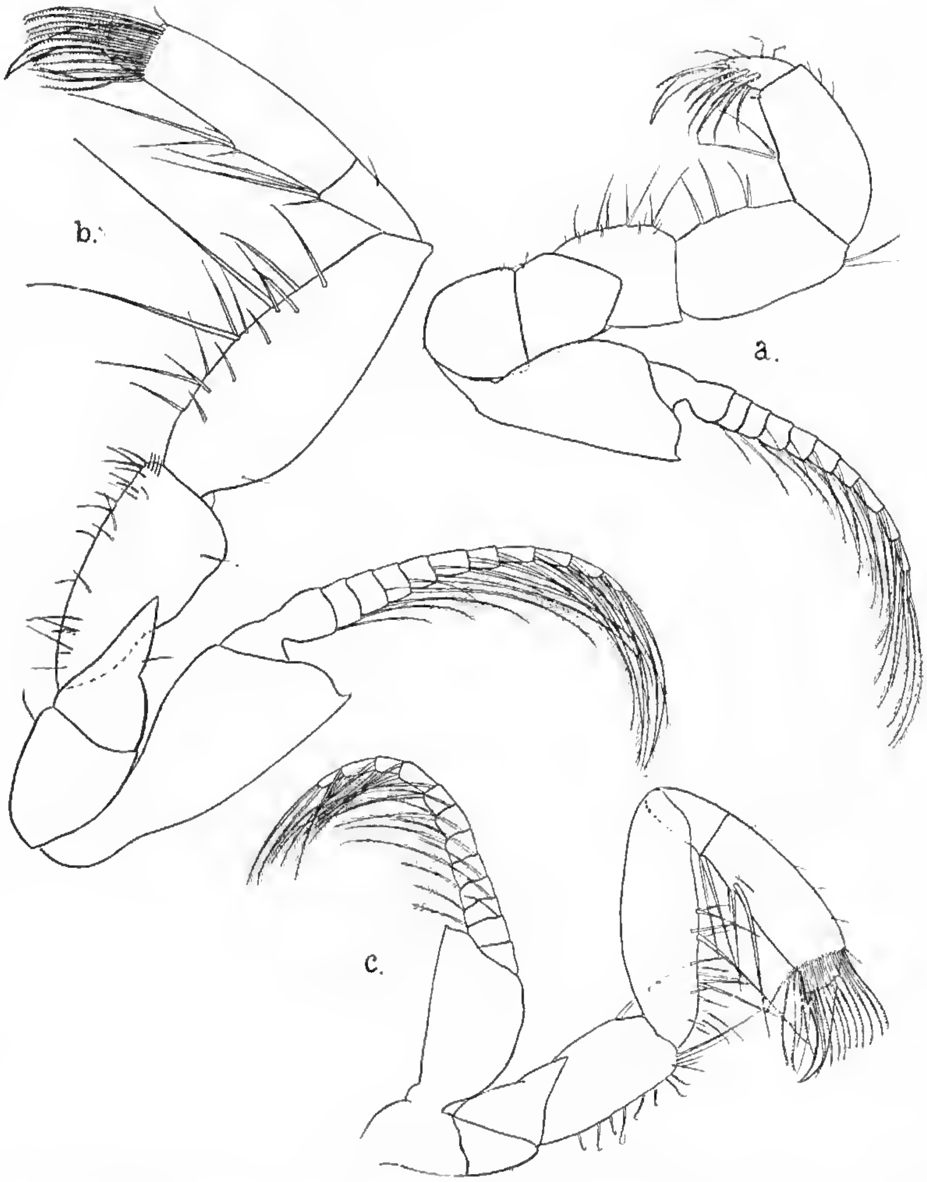

Fig. 96. *Siriella halei; a, b,* and *c,* second, third, and eighth thoracic limbs (39 diam.).

second joint one and a half times as long as the third; a prominent spine on the outer distal corner of the joint from which the scale arises. The *thoracic limbs* are best described by reference to the accompanying figures. They are robust in build, much stouter than in any other species known to me. The sixth joint of shorter than broad, slightly over-reaching the marginal denticle, a small distal joint marked off by a distinct suture; antennal peduncle shorter than the scale, the endopod of the third to the eighth pair is divided by an articulation into a short proximal and a long distal portion. The basal plate of the exopods is acutely pointed at the outer distal corner, and the flagellum of the exopod is composed of eleven or twelve joints. *Sixth abdominal somite* at least one and a half times as long as the fifth. *Telson* slightly longer than the last abdominal somite, about as long as the proximal portion of the outer uropod and twice as long as broad at the base, with eighteen spines on its lateral margins, three at the proximal end being larger than the remainder and separated from them by a short unarmed interval. The remaining fifteen increase more or less regularly in size to the terminal spines, which are about one-ninth of the length of the telson; there is only a single pair of spines at the apex, and between them are three small subequal spinules and a pair of plumose setae. *Inner uropods* one quarter longer than the telson, with a closely set row of spines on the lower inner margin from the statocyst to the apex; these spines are arranged in series of two, three, or four, the distal five or six spines very large and slightly recurved, without smaller spines between them. *Outer uropods* half as long again as the telson, the distal joint about one-quarter of the whole and one and a half times as long as broad; distal third of the outer margin of the proximal joint with a row of nine graded spines. *Pseudobranchial rami* of the second to the fourth pleopods of the male spirally coiled; distal setae of both rami of the third and fourth pleopods unmodified.

Length. Immature females with the brood pouch just developing, 12 mm.; apparently mature male, 12 mm.

Loc. South Australia: Gulf St. Vincent, 6 miles off Semaphore, 6-7 fathoms, and 5 miles off Semaphore, 5 fathoms (H. M. Hale). Syntypes in South Australian Museum, Reg. No. C. 1614.

Two immature females and one apparently mature male were collected. This species is evidently a large one, probably reaching 16 mm. when fully grown. In general habitus it recalls such large littoral species as *S. armata* and *S. frontalis*, but it is quite distinct from any species known to me in the form of the front margin of the carapace and by the robust character of the thoracic limbs.

I have pleasure in associating this very well-marked species with the name of Mr. H. M. Hale, who has himself collected nearly the whole of the material on which this report is based, and who has spared no pains to meet my request for Australian Mysidae.

SIRIELLA VINCENTI sp. nov.

Carapace short, leaving the last thoracic somite uncovered; front margin only slightly produced as a short, evenly rounded rostral plate not completely covering the eye-stalks; a prominent pseudo-rostral spine below the rostral plate and projecting in front of the latter. *Eyes* of moderate size, as long as the first joint of the antennular peduncle, one and a half times as long as broad, cornae occupying about one-third of the whole eye, pigment black. *Antennal scale* very nearly as long as the antennular peduncle, three and a quarter times as long as broad, marginal spine prominent, terminal lobe about as long as broad, considerably over-reaching the marginal spine, no distal articulation marking off a terminal joint. *Antennal peduncle* shorter than the scale, second joint two and a half times as long as the third; a prominent spine on the outer distal corner of

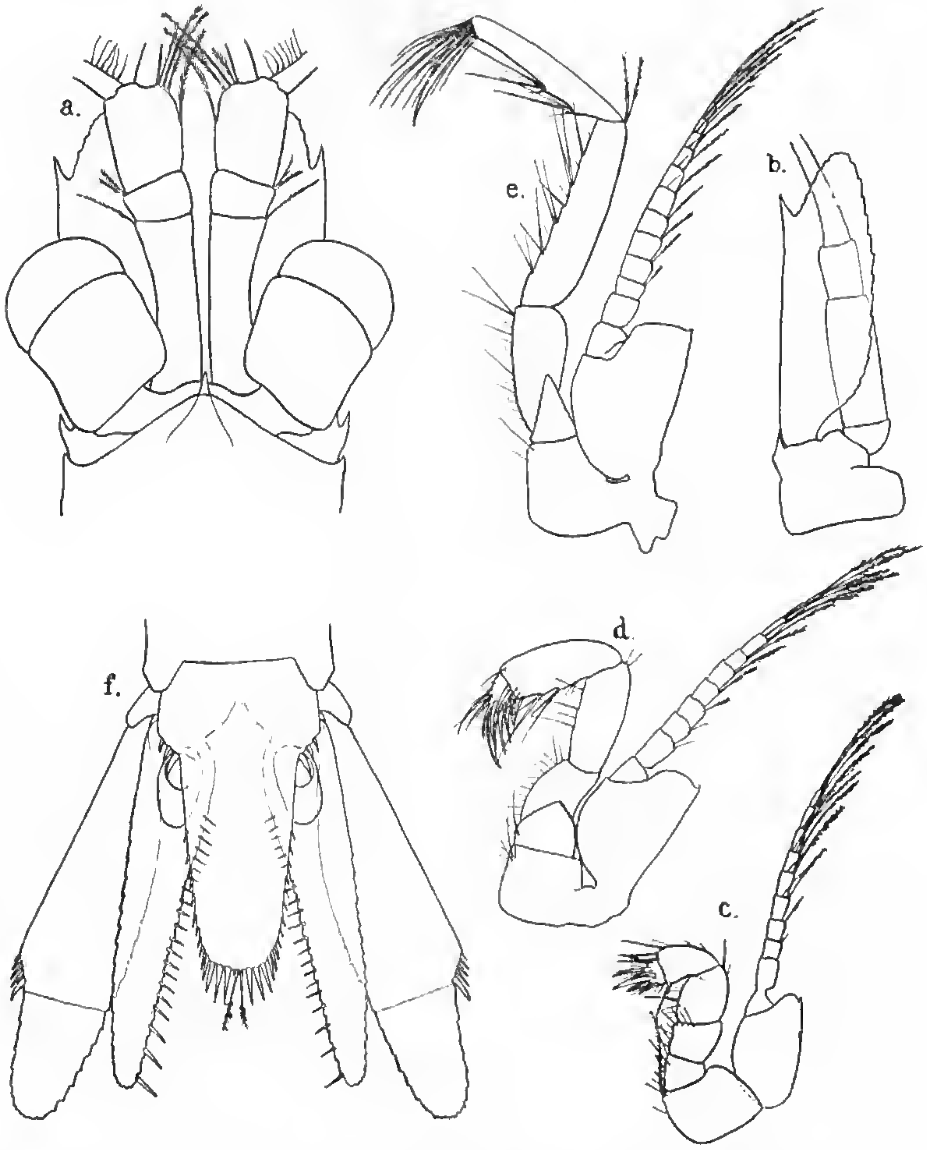

Fig. 97. *Siriella vincenti*; *a*, dorsal view of anterior end of female; *b*, antennal scale and peduncle; *c*, *d*, and *e*, first, second, and third thoracic limbs; *f*, telson and uropods (39 diam.).

the joint from which the scale arises. The *thoracic limbs* are best described by reference to the accompanying figures. The first and second pairs are moderately robust and short, the second being considerably shorter than the corresponding limb in *S. australis* (see p. 254, fig. 99). The remaining limbs are moderately slender, with the sixth joint undivided, as far as I can see. The basal plate of the exopod is acutely pointed at the outer distal corner, and the flagellum is composed of nine to twelve joints. *Sixth abdominal somite* one and a half times as long as the fifth. *Telson* as long as the last abdominal somite and twice as long as broad at the base, broadly linguiform in shape, apex rather broadly rounded and about one-sixth of the length of the telson in breadth; lateral margins with three large, stout spines proximally, followed by a short unarmed portion, then a series of fifteen spines on each side, increasing generally in size to the apex, the last three spines on each side actually on the apex, larger than the rest, the central pair about one-eighth of the telson in length; three sub-equal spinules and a pair of long plumose setae, longer than the terminal spines, between the central pair of spines of the apex. *Inner uropods* one-third longer than the telson, with a row of prominent spines on the inner margin, increasing regularly in size towards the apex, and not arranged in series or groups. *Outer uropods* half as long again as the telson; distal joint one and a half times as long as broad; distal end of the outer margin of the proximal joint with a group of five graded spines. *Pseudobranchial rami* of the second to the fourth pairs of pleopods of the male spirally twisted; none of the distal setae of the third and fourth pleopods modified.

Length. Three males and eight females; up to 8 mm. for adults of both sexes.

Loc. South Australia: Gulf St. Vincent, 6 miles off Semaphore, 6-7 fathoms (H. M. Hale). Syntypes in South Australian Museum, Reg. No. C. 1615.

Compared with the following species *(S. australis)*, *S. vincenti* shows the following points of difference:

(1) Rostral plate shorter and bluntly rounded.
(2) Antennular peduncle and eye longer and less robust.
(3) First and second thoracic limbs, especially the second, with the endopods shorter and stouter.
(4) Sixth joint of the endopod of the third to the eighth thoracic limbs unjointed.
(5) Telson broadly linguiform in shape.
(6) Spines on the inner uropod not arranged in groups or series.

Among the large number of species of the genus already described, *S. vincenti* approaches very closely to *S. quadrispinosa* Hansen (3). The telson has the same broadly linguiform shape and a similar armature, except that in *S. vincenti* there are three pairs of spines on the apex, the central pair of which are the longest, whereas in *S. quadrispinosa* there are two pairs of spines on the apex, the outer pair of which are the longer. *S. vincenti*, however, differs from *S. quadrispinosa* in the shorter and bluntly rounded rostral plate, in the unjointed antennal scale and sixth joint of the thoracic limbs, in the arrangement of the spines on the inner uropod, and in the fewer number of spines on the outer uropod. *S. vincenti* is perhaps still more nearly related to *S. hanseni* Tattersall (6), but has a longer telson and more spines on both inner and outer uropods. In both species the scale is unjointed, and the sixth joint of the thoracic limbs undivided.

SIRIELLA AUSTRALIS sp. nov.

Carapace short, leaving the last and part of the penultimate thoracic somites exposed; front margin produced into an acutely triangular rostral plate covering the eye-stalks; no pseudo-rostral process observed. *Eyes* shorter and broader than in *S. vincenti*, nearly as broad as long, cornea occupying nearly one-half of the eye, pigment black. *Antennular peduncle* with the third joint as long as the first; a long, stout seta on the dorsal surface of the second joint near the inside of the front margin; this seta is as long as the third joint and more robust in the male than in the female. *Antennal scale* extending about half-way along the last joint of the antennular peduncle, three times as long as broad, marginal spine prominent, terminal lobe slightly broader than long, and considerably overreaching the marginal spine, no distal articulation. *Antennal peduncle* shorter than the scale, second joint three times as long as the third. The *thoracic limbs* are best described by reference to the accompanying figures. The first limb is moderately robust and short, but the second limb has the endopod relatively

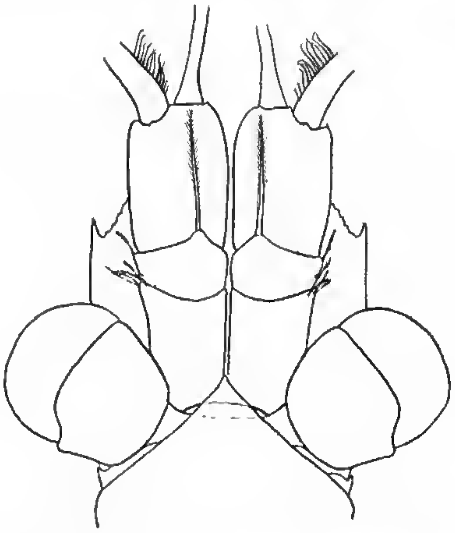

Fig. 98. *Siriella australis:* dorsal view of anterior end of female (22 diam.).

much longer and slenderer than in *S. vincenti*, chiefly owing to the elongation of the fifth and sixth joints. The remaining limbs are slender and long, with the sixth joint divided into two, the proximal portion slightly shorter than the distal. The nail is relatively long, with a prominent spine on the inner margin. The basal plate of the exopod is acutely pointed at the outer distal corner, and the flagellum is composed of from nine to twelve joints. *Sixth abdominal somite* one and a half times as long as the fifth. *Telson* slightly longer than the last abdominal somite, narrowly linguiform in shape, two and a half times as long as broad at the base, apex rather narrow and equal in breadth to one-third of the base, lateral margins with two prominent spines proximally at the base, followed by a short unarmed portion and then a series of fourteen spines increasing generally in size towards the apex, the last spine the longest and about one-eighth of the telson in length; between the central pair of spines at the apex are situated three equal spinules and a pair of plumose setae as long as the terminal spines. *Inner uropod* one-third longer than the telson, with a row of prominent spines on the inner margin arranged in series, particularly towards the apex. *Outer uropod* only slightly longer than the inner and about one and a half times as long as the telson, distal joint one and three-quarter times as long as broad, proximal joint with a group of four to six graded spines at its distal end. *Pseudo-branchial rami* of the second to the fourth pair of pleopods of the male spirally twisted; none of the setae on the male pleopods modified.

Length. Adult male 10 mm.; adult female 8 mm.

Loc. South Australia: Gulf St. Vincent, 6 miles off Semaphore, 6-7 fathoms, and 5 miles off Semaphore, 5 fathoms (H. M. Hale). Syntypes in South Australian Museum, Reg. No. C. 1616.

Four examples of each sex were taken. *S. australis* may be distinguished from *S. vincenti* by the following characters:

(1) The longer and more acute rostral plate and the absence of a pseudo-rostral spine.
(2) The shorter and stouter eyes and antennular peduncle.
(3) Sixth joint of the endopod of the thoracic limbs divided into two sub-joints.
(4) Spines on the inner uropod arranged in groups.
(5) Telson rather longer and more narrowly linguiform in shape.

Among described species of the genus *S. australis* appears to be most nearly related to *S. vulgaris* and *S. affinis*, described by Hansen from the waters of the East Indian Archipelago. It differs, however, from both of these species in the unjointed antennal scale. The telson has the same narrowly linguiform shape in all three, and the spines arming its lateral margins increase regularly in length towards the apex, and are not arranged in groups. *S. australis* agrees with *S. vulgaris* in the character and arrangement of the spines on the inner uropod.

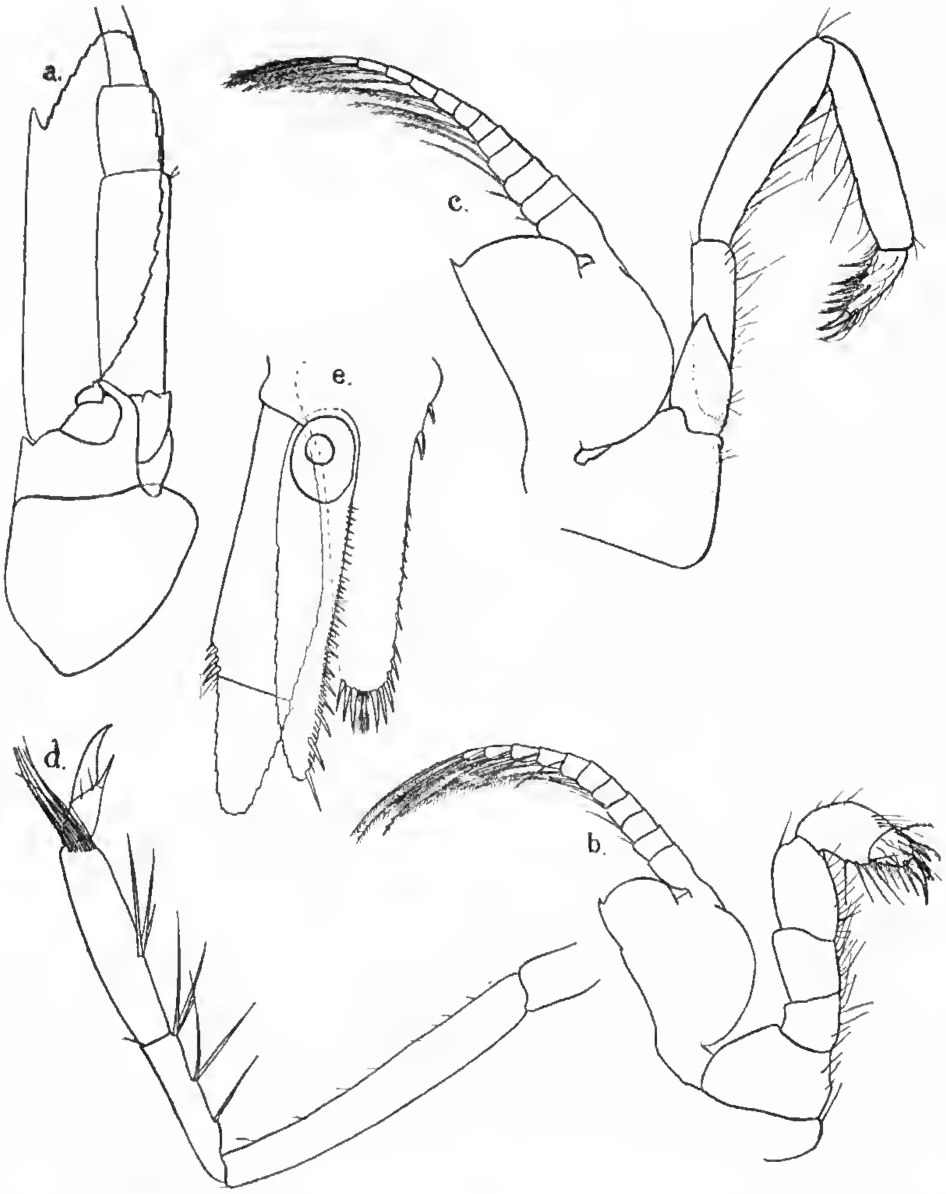

Fig. 99. *Siriella australis; a*, antennal scale and peduncle (39 diam.); *b* and *c*, first and second thoracic limbs (39 diam.); *d*, endopod (distal joints) of third thoracic limb (50 diam.); *e*, telson and uropod (39 diam.).

A specimen of *Siriella* from the following locality, Kingscote, north coast of Kangaroo Island, South Australia, ½ fathom (H. M. Hale), is probably to be referred to this species, but the telson has been broken off, and its identity must therefore remain doubtful.

Some years ago the late Professor S. J. Johnston gave me some specimens of a *Siriella* obtained by tow-netting at Port Hacking, New South Wales. The specimens are in poor condition, but appear to agree in the main with *S. australis*, except that the spines on the lateral margins of the telson are more numerous (twenty-two as against fourteen).

SUB-FAMILY GASTROSACCINAE Norman.

PARANCHIALINA Hansen.

Anchialus (pars.) G. O. Sars, 1883, 1885.
Paranchialina Hansen, 1910, p. 51.

Hansen (3) established this genus for the species, *Anchialus angustus* G. O. Sars, found by the Challenger Expedition at the entrance to Port Philip, Victoria. It is distinguished from *Anchialina* by the following features: Body is slender, carapace leaving uncovered the whole of the last thoracic somite and part of the preceding somite, first thoracic limb (maxilliped) with a prominent lobe from the second joint, second and third thoracic limbs without sexual differences, first three pleopods of the female normal and styliform, last two pairs in the form of transverse lamellae, no pseudo-branchial lamellae on the pleopods of either sex, uropod with only two spines near the middle of its outer margin, proximal portion of this margin unarmed, distal portion setiferous.

PARANCHIALINA ANGUSTA G. O. Sars.

Anchialus angustus G. O. Sars, 1883, p. 39, and 1885, p. 197, pl. xxxv, fig. 1-18.
Paranchialana angusta Hansen, 1910, p. 51.

A male and female, and two adult females with brood lamellae and young in the brood pouch are before me. The male is 7 mm. in length, the females are each 8 mm. in length.

Loc. South Australia: Gulf St. Vincent, 6 miles off Semaphore, 6-7 fathoms, and 5 miles off Semaphore, 5 fathoms (H. M. Hale).

Sars' description and figures are adequate for the identification of this species. The body is minutely hispid all over, most markedly on the eye-stalks and along the lateral portions of the abdomen.

Sars gives the number of spines on the lateral margins of the telson as from twenty to thirty, in specimens of 10 mm. The present specimens, 8 mm. in length, have only about thirteen to fifteen spines.

The pleopods of the male have been described by Sars. He was, however, in error in stating that the exopod of the fourth pair is elongated. Hansen has correctly noted that it is the exopod of the third pair which is elongated. The first and fifth pleopods of the male have only the endopod present, while the second and fourth pairs have both exopod and endopod present and more or less equal in length.

Prior to the specimens here recorded, the "Challenger" material of two adult females and one broken male, from the entrance to Port Phillip, comprised the whole of the known specimens of this species. It is, therefore, as far as present knowledge goes, only known from Australian waters.

SUB-FAMILY MYSINAE.

LEPTOMYSIS G. O. Sars.

LEPTOMYSIS AUSTRALIENSIS sp. nov.

Carapace short, leaving the last thoracic somite completely uncovered, front margin produced between the eyes into a triangular, bluntly pointed rostral plate, extending about one-quarter along the basal joint of the antennular peduncle, covering the eye-stalks but leaving the eyes themselves exposed; antero-lateral corners rounded. *Eyes* large, as long as the first joint of the antennular peduncle, rather longer than broad, cornea occupying rather more than half the eye, pigment black. *Antennal scale* very long and narrow, extending for quite half its length beyond the antennular peduncle, eight times as long as broad, setose all round, apex narrowly rounded, a small terminal joint marked off by a distinct suture. *Antennal peduncle* about one-third as long as the scale, second joint longer than the third. The *thoracic limbs* are best described by reference to the accompanying figures. They are robust in build. The sixth joint of the endopod of the third to the eighth pair is divided into three or four sub-joints, the whole joint about as long as the fifth, nail long and slender. The basal plate of the exopods is acutely pointed at its outer distal corner, and the flagellum is composed of eight or nine joints. *Sixth abdominal somite* one and a half times as long as the fifth. *Telson* slightly shorter than the sixth abdominal somite, entire, narrowly linguiform in shape, gradually narrowing to a bluntly rounded apex, distal part not expanded as in *L. lingvura*, about twice as long as broad at base, lateral margins armed with about fifty closely-set spines, not arranged in series, gradually increasing in size distally, the terminal pair of spines at the apex about one-ninth of the telson in length, no plumose setae. *Inner uropod* one and a quarter times as long as the telson, with a prominent spiniform, blunt projection on the dorsal face of the statocyst, near the postero-lateral outer corner, visible in dorsal view; inner ventral margin of the uropod with a row of seven spines, increasing in length distally, four of them on the statocyst, the remaining three distal to the statocyst and widely separated, the last spine long and stout, and situated about the centre of the lower inner margin; a series of small spinules round the inner margin of the statocyst. *Outer uropods* about one-third longer than the inner. *Pleopods* of the characteristic form met with in the genus. The exopod of the fourth pair in the male is longer than the endopod, and has modified setae on the last four joints. On each of the third and fourth joints from the apex there is a single very powerful seta, with the distal half transversely striated. On the penultimate joint there is a single stout plumose seta, while the terminal joint ends in two moderately long and stout setae, which are sparsely plumose.

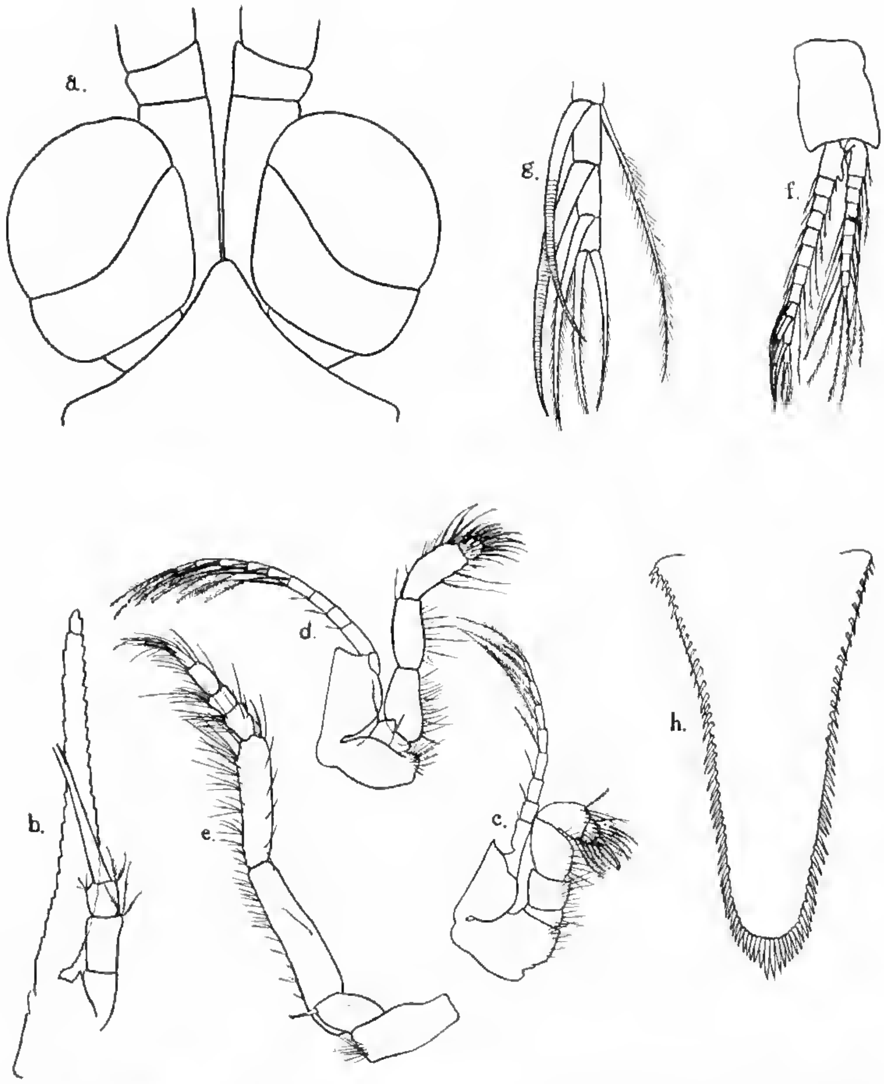

Fig. 100. *Leptomysis australiensis; a,* anterior end to show rostral plate and eyes (39 diam.); *b,* antennal scale and peduncle (21 diam.); *c* and *d,* first and second thoracic limbs (21 diam.); *e,* endopod of third thoracic limb (21 diam.); *f,* fourth pleopod of male (21 diam.); *g,* distal joints of exopod of fourth pleopod of male (180 diam.); *h,* telson (39 diam.).

Length. Adult specimens of both sexes, 12 mm.

Loc. South Australia: Gulf St. Vincent, 6 miles off Semaphore, 6-7 fathoms, and 5 miles off Semaphore, 5 fathoms (H. M. Hale). Syntypes in South Australian Museum, Reg. No. C. 1617.

This is a characteristic species of the genus, distinguished from described species by the combination of characters provided by the extreme length and narrowness of the antennal scale, the shape and armature of the telson, the sixth joint of the endopod of the third to the eighth thoracic limbs, and the fourth pleopod of the male.

I have received several specimens from Mr. Hale, taken at various points in Gulf St. Vincent, in 5-6 fathoms of water. The species appears to be quite common in the Gulf.

AUSTRALOMYSIS gen. nov.

Mandible with a well-developed molar process; second maxilla with the setiform lobe on the second joint well developed; antennal scale lanceolate-oval in shape, setose all round, with a distal articulation; first thoracic limbs with a large lobe from the second joint and a well-developed lobe from the third, second and third joints not coalesced; sixth joint of the endopod of the third to the eighth thoracic limbs divided by one or two articulations; telson cleft, the cleft armed with teeth, but without plumose setae; inner uropods with a row of spines on the inner margin; pleopods of the male as in the genus *Leptomysis*, exopod of the fourth pair larger than the endopod, with modified setae on the last three joints; three pairs of brood lamellae in the female.

Type. *Mysidopsis incisa* G. O. Sars.

The single type specimen, and up till now the only recorded one, of *Mysidopsis incisa* was taken by the Challenger Expedition in Port Philip, Victoria. It was not dissected by Sars, and was referred on other characters to the genus *Mysidopsis*. In the material forwarded to me from the South Australian Museum are several specimens which are clearly referable to Sars' species, but on dissection prove to differ widely from *Mysidopsis* in the character of the mouth parts and to approach much more closely to *Leptomysis*. In *Mysidopsis* the mandible lacks a molar process, the lobe from the second joint of the maxilla lacks the broad setiferous expansion, and the second and third joints of the endopods of the first thoracic limbs are fused. In all these points *M. incisa* differs from *Mysidopsis* and agrees with *Leptomysis*. It is clear that the species cannot remain in the genus *Mysidopsis*. The species differs from *Leptomysis* in the form of the telson, which is cleft, the cleft armed with teeth, whereas in *Leptomysis* it is entire. The fourth pleopods of the male differ slightly from those of *Leptomysis*, and the sixth joint of the endopod of the third to the eighth thoracic limbs has but one or two articulations. These characters combined appear to be of generic value, and I therefore propose this new genus to include *Mysidopsis incisa* G. O. Sars and a second species found in the present material. The genus is not unlike *Doxomysis*, but lacks plumose setae at the apex of the telson. It differs from *Mysidetes* in the characters of the pleopods of the male.

AUSTRALOMYSIS INCISA G. O. Sars.

Mysidopsis incisa G. O. Sars, 1884 and 1885, p. 202, pl. xxxv, fig. 21-23.

Thirteen females and five males, up to 7 mm. in length, were taken in January of last year.

Loc. South Australia: Vivonne Bay, south coast of Kangaroo Island, 3-3½ fathoms (H. M. Hale).

Sars' description is adequate for the recognition of this species. A few notes on certain features are added for comparison with the new species described below. The antennal scale is four times as long as broad, with a well-marked distal articulation. The proximal portion of the eye is minutely spinulose, and the whole eye is broader and more flattened than in the next species. The rostral plate is short and bluntly rounded, and there is a short pseudo-rostral process beneath. The antero-lateral corners of the carapace are rounded. The articulations dividing the sixth joint of the endopod of the thoracic limbs are transverse, and not oblique. There is a short but distinct gap between the proximal three and the remaining spines arming the lateral margins of the telson. The spines on the inner uropod are arranged in series of two or three, except towards the apex.

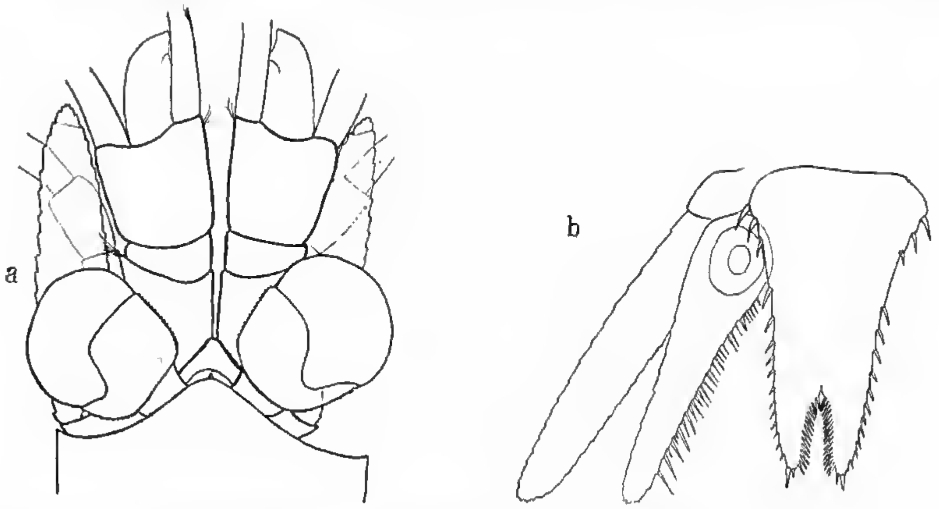

Fig. 101. *Australomysis incisa; a,* dorsal view of anterior end of male; *b,* telson and uropods (38 diam.).

AUSTRALOMYSIS ACUTA sp. nov.

Carapace with the front margin produced as a conspicuous acutely pointed rostral plate not covering the eye-stalks; antero-lateral corners of the carapace acutely pointed; below the rostral plate there is a conspicuous pseudo-rostral process tipped by a single seta. *Eyes* about twice as long as broad, not flattened, cornea occupying the distal third; eye not hispid. *Antennal scale* four times as long as broad, with a distal joint. *Thoracic limbs* with the endopods having the sixth joint divided by a single oblique articulation into a longer proximal and a shorter distal portion: nail short, with a short spine on the inner margin. *Telson* one-quarter longer than the sixth somite of the abdomen, nearly twice as long as broad at the base, narrowing to an apex, which is only one-third of the width at the base, apex cleft, the cleft about one-fifth of the total length of the telson, and armed with teeth on each margin but no plumose setae; lateral margins of the telson armed with about eighteen spines, distributed throughout the entire

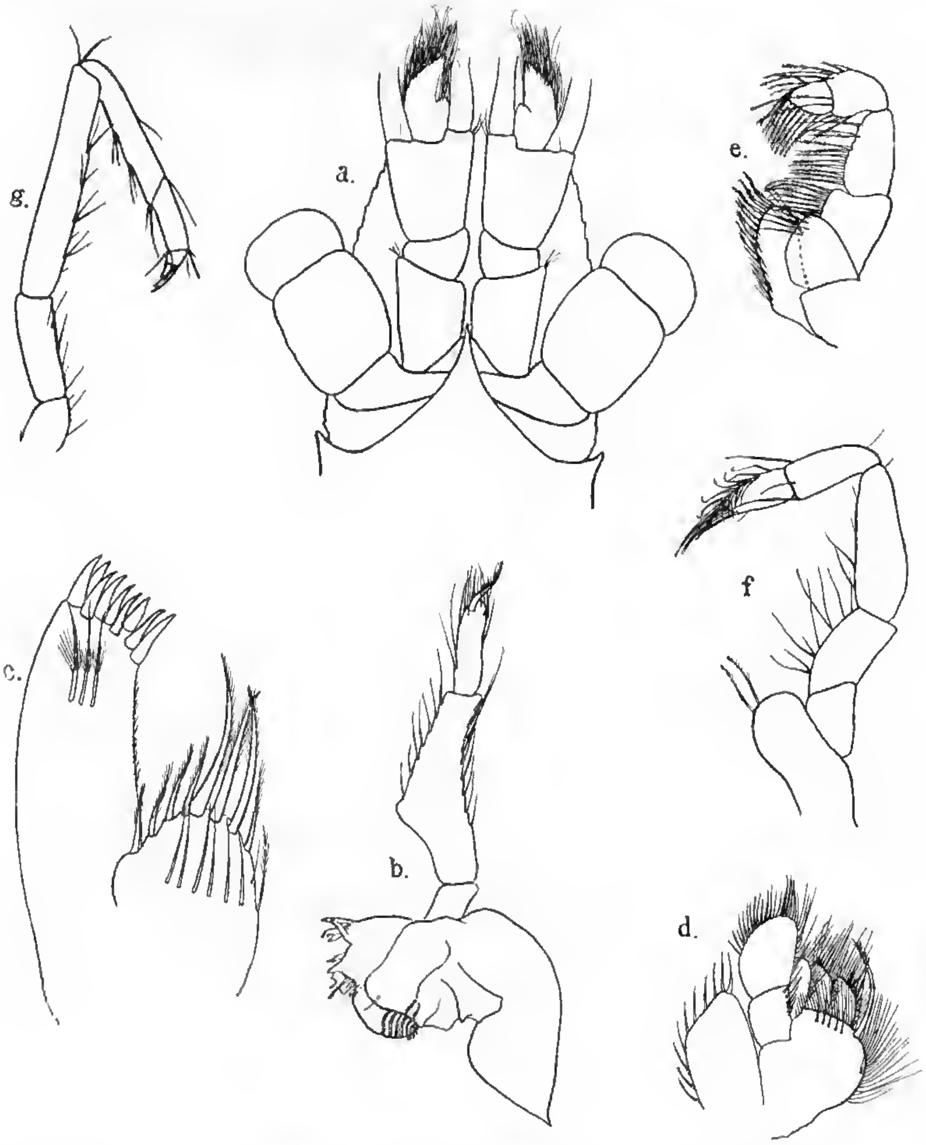

Fig 102. *Australomysis acuta; a,* dorsal view of anterior end of male (39 diam.); *b,* mandible (50 diam.); *c,* first maxilla (180 diam.); *d,* second maxilla (50 diam.); *e* and *f,* endopod of first and second thoracic limbs (50 diam.); *g,* distal joints of endopod of third thoracic limb (50 diam.).

length of the margins, without any unarmed interval, the terminal spine one-ninth of the length of the telson. *Inner uropod* only slightly longer than the telson, with a row of twenty-two spines on the lower inner margin from the statocyst to quite near the apex, these spines becoming longer and more distantly placed distally, but not arranged in groups or series. *Outer uropod* one and a half times as long as the telson. *Pleopods* of the male essentially as in the genus *Leptomysis*. Exopod of the fourth pair longer than the endopod, with a powerful plumose seta on the antepenultimate and penultimate joints, the terminal joint with two long, equal, slender, smooth, spiniform setae.

Length. Adult male and female, 8 mm.

Loc. South Australia: Gulf St. Vincent, 6 miles off Semaphore, 6-7 fathoms (H. M. Hale).

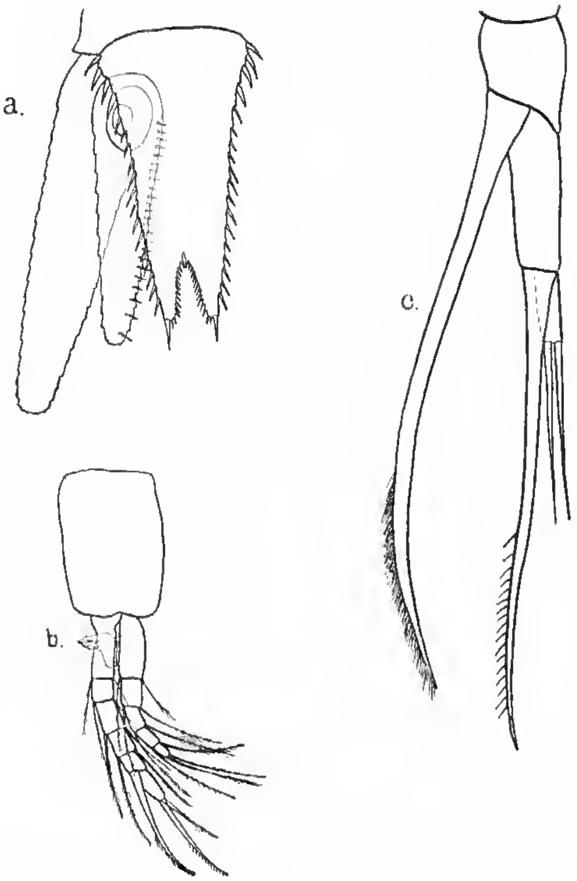

Fig. 103. *Australomysis acuta; a*, telson and uropod (39 diam.); *b*, fourth pleopod of male (39 diam.); *c*, distal joints of exopod of fourth pleopod of male (180 diam.).

In its other features this species agrees essentially with *A. incisa*. The figures of the mouth parts which are given to illustrate the characters of the genus are taken from appendages of *A. acuta*. The mouth parts of *A. incisa* are substantially the same. The main differences between the two species are best summarized in tabular form:

	A. incisa.	*A. acuta.*
(a) Rostral plate	short, bluntly rounded.	well developed, acute.
(b) Antero-lateral angles of the carapace	rounded.	acutely pointed.
(c) Eye	short and broad, flattened dorso-ventrally.	rather longer and narrower and not flattened.
(d) Telson	with a short unarmed portion of the lateral margins.	spines of the later margin forming a continuous series.
(e) Inner uropod	spines arranged in groups of two or three.	spines not grouped.
(f) Sixth joint of the endopods of thoracic limbs	divided by two transverse articulations.	divided by one oblique articulation.

The last of these differences is interesting and peculiar. Hansen (3) says that oblique articulations are known only in the tribe *Erythropini*, but I have already noted them in a species of *Doxomysis*, which also belongs to the tribe *Leptomysini*.

TRIBE MYSINAE.

ANISOMYSIS Hansen.

ANISOMYSIS AUSTRALIS Zimmer.

A. australis Zimmer, 1918, p. 22, text figs. 27-32.

There are before me one female from South Australia, and thirteen females and five adult males from New South Wales. I have nothing to add to Zimmer's description, with which these specimens agree completely. Port Phillip is the type locality.

Length. Both sexes, 5 mm.

Loc. South Australia: Vivonne Bay, south coast of Kangaroo Island (H. M. Hale). New South Wales: Port Hacking, in surface tow-net (S. J. Johnston).

TRIBE HETEROMYSINI.

HETEROMYSIS S.I.Smith.

HETEROMYSIS WAITEI sp. nov.

Carapace completely covering the thorax, with the front margin produced into a bluntly triangular rostral plate, not extending beyond the eyes, and in part occluding the eye-stalks. *Eyes* small, longer than wide, cornea occupying less than one-half of the eye in dorsal view, a prominent, acute spine on the upper distal border overhanging the cornea; surface of the eye, except the cornea, spinulose. *Antennular peduncle* with a single stout spine on the inner distal corner of each of the second and third joints. *Antennal scale* as long as its peduncle, extending half-way along the last joint of the antennular peduncle, two and a half times as long as broad, setae all round, a small distal portion divided off by a suture. *Third thoracic limbs* with the endopod moderately short and robust, merus rather more than twice as long as broad, without a process at the distal end of the inner margin, carpus robust, shorter than the merus, twice as long as broad, inner margin armed with two stout spines in the female and four in the male, each spine with a seta inserted near the tip and a row of minute tubercles on distal margin; propodal joint very short and without spines or processes; dactylus half as long as the carpus, and strongly curved. *Remaining thoracic limbs* with the sixth joint of the endopod divided into nine sub-joints, of which the first is the largest; sixth joint equal to the fifth and shorter than the fourth; nail short and curved; outer distal corner of the basal plate of the exopods acuminate. *Sixth abdominal somite* only slightly longer than the fifth. *Telson* one and a half times as long as the sixth abdominal somite, and one and a half times as long as broad at the base; apex one-third as broad as the base, cleft one-fifth of the total length armed with eleven or twelve teeth on each side, extending throughout the entire edges; each lobe of the apex with two spines, the outer about one-eighth of the length of the telson and three times as long as the inner; lateral margins of the telson with fifteen to seventeen spines extending throughout the entire margin, an interval of varying length between the last marginal spine and the terminal spines on the apical lobe. *Inner uropod* one-quarter longer than the telson, with three or four spines on the inner margin near the statocyst. *Outer uropod* half as long again as the telson.

Length. Adult female, 9 mm.; adult male, 11 mm.

Loc. South Australia: Gulf St. Vincent, Outer Harbour (type loc.), and 5 miles off Semaphore, 5 fathoms, and 6 miles off Semaphore, 5 fathoms (H. M. Hale). Type in South Australian Museum, Reg. No. C. 1618.

The type female, two males (8-11 mm.), and two immature specimens, were secured. The young examples, 3·5 mm. and 5 mm. in length, differ from adults in the armature of the cleft of the telson. The teeth on the cleft are fewer in number, and do not extend along the entire margin, the distal portion of which is smooth and unarmed.

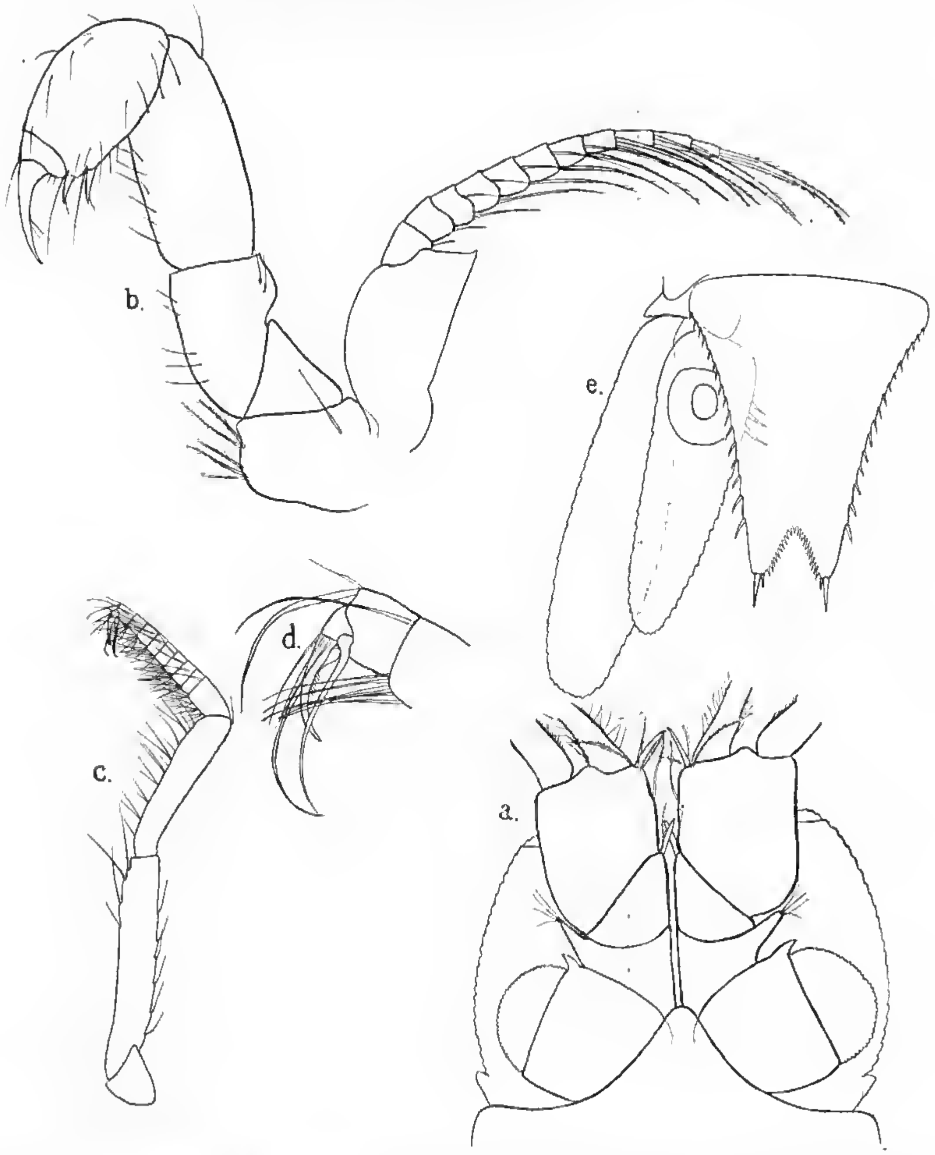

Fig. 104. *Heteromysis waitei; a,* dorsal view of anterior end of female (32 diam.); *b,* third thoracic limb of female (33 diam.); *c,* endopod of fourth thoracic limb of female (33 diam.); *d,* distal extremity of endopod of fourth thoracic limb of female (180 diam.); *e,* telson and uropod (32 diam.).

This species is distinguished from the following one by the spine over the eye, the armature of the telson and inner uropods, and the form of the endopod of the third thoracic limb.

H. waitei belongs to the same group of the genus as *H. odontops* Walker and *H. zeylanica* Tattersall, both of which have spiniform processes over the eyes. It is distinguished from the latter by the armature of the telson, the fewer spines on the inner uropod, and the larger number of sub-joints in the sixth joint of the endopod of the thoracic limbs. The carpal joint of the endopod of the third thoracic limb in *H. waitei* is shorter than in *H. zeylanica*, and the whole limb is relatively more robust.

In the light of the young specimens of *H. waitei* in this collection, it seems possible that my description of *H. zeylanica* is based on young specimens, and the differences between the telson in the two species may not hold for adults. In *H. zeylanica* the teeth arming the cleft are confined to the proximal half of its margins, and the spines arming the lateral margins are arranged in two groups, a proximal and a distal, with a short unarmed interval between. From the present observations on *H. waitei* the former character is certainly juvenile, and it seems not unlikely that with increase in size the unarmed interval on the lateral margins will become occupied with spines.

HETEROMYSIS TASMANICA sp. nov.

Carapace completely covering the thorax, with the front margin produced into a pointed, triangular rostral plate, rather more acute than in *H. waitei*, not extending beyond the eyes, and partly covering the eye-stalks. *Eyes* small, longer than wide, cornea occupying about one-third of the eye, no acute spine overlapping the cornea, surface of the eye smooth, pigment black. *Antennal scale* nearly three times as long as broad, setose all round, almost as long as the antennular peduncle, a small distal portion marked off by a suture. *Third thoracic limbs* with the endopod large and robust, merus more than two and a half times as long as broad, without a process at the distal end of the inner margin, carpus robust, longer than the merus and somewhat broader, nearly three times as long as broad, the inner margin armed with a row of nine or ten spines, each with a barbed seta arising from its base, the spines increasing in length and stoutness distally, the last two or three with a blunter apex and one or two subsidiary tubercles on the distal margin, propodal joint small, nail long and curved, with three or four long, barbed setae, as long as the nail, arising at its base. *Remaining thoracic limbs* with the sixth joint of the endopod divided into seven sub-joints; sixth joint shorter than the fifth, which in turn is shorter than the fourth; the whole limb rather more slender than in *H. waitei*; outer distal corner of the basal plate of the exopod rounded. *Sixth abdominal somite* one and a third times as long as the fifth. *Telson* one and a quarter times as long as the sixth abdominal somite, and as broad as the latter is long at the base; apex one-third as broad as the base; telson cleft for one-fifth of its length, the cleft armed with about twelve teeth on each margin, extending the whole length of the margins; each lobe of the apex armed with two spines, the outer about twice as long as the inner and about one-twelfth of the length of the telson; lateral margins of the telson armed with about thirteen to fifteen spines on the distal two-thirds only, the proximal third being unarmed. *Inner uropod* slightly longer than the telson, with a row of about sixteen spines on the inner margin, extending from the statocyst nearly to the apex. *Outer uropod* about one-quarter longer than the telson.

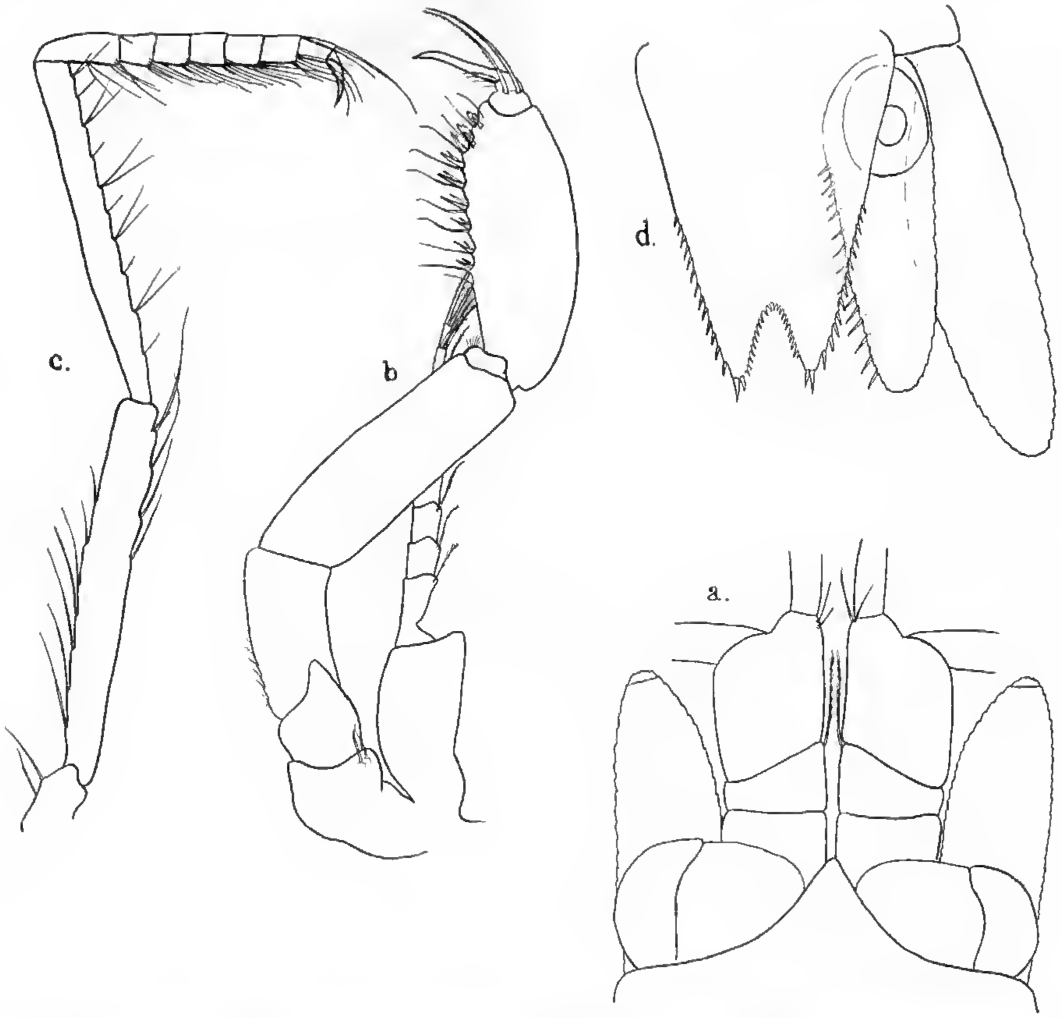

Fig. 105. *Heteromysis tasmanica*; *a*, dorsal view of anterior end of male (32 diam.); *b* and *c*, third thoracic limb, and endopod of fourth thoracic limb of male (22 diam.); *d*, telson and uropod (32 diam.).

Length. Adult males, 12 mm.

Loc. South Australia: Gulf St. Vincent, 5 miles off Semaphore, 5 fathoms (H. M. Hale). Tasmania: D'Entrecasteaux Channel (type loc., W. M. Tattersall).

Three males were secured in Tasmania and one in South Australia. In all these specimens there is a median sausage-shaped process on the sternum of the thorax, attached between the bases of the third thoracic limbs and projecting backwards between the bases of the remaining limbs. There is nothing similar in *H. waitei*, and in the absence of females I am unable to say whether it is a secondary sexual character.

This species belongs to the *H. harpax* group of the genus, and comes nearest to *H. proxima* Tattersall, from Ceylon, from which it is distinguished by the larger number of spines on the inner uropod, by the larger number of sub-joints in the sixth joint of the endopod of the thoracic limbs, and by details of the endopod of the third thoracic limbs. The type specimens were collected by myself when on a visit to Tasmania in 1914. It was therefore not without interest to find a specimen in the collection from South Australia which, though smaller in size, agrees very closely with the Tasmanian specimens, except in the fewer number of spines on the inner uropod (eight) and the fewer teeth in the cleft of the telson (six), characters which vary with age.

List of Literature.

1. Colosi G. 1918. Nota preliminare sui Misidacei raccolti dalla R.N. "Liguria" nel 1903-05, Bull. Soc. Entom. Ital., ann. xlix, 1917, p. 1-11.
2. Colosi G. 1920. Raccolte planctoniche fatte dalla R. Nave "Liguria," ii., Fasc. IX, Crostacei-Parte iv, Misidacei, p. 229-260, pl. 18-20.
3. Hansen H. J. 1910. The Schizopoda of the Siboga Expedition, Siboga Reports, No. xxxvii.
4. Sars G. O. 1883. Preliminary notices on the Schizopoda of H.M.S. "Challenger" Exped., Forhandl. Vidensk. Selsk., Christiania.
5. Sars G. O. 1885. Report on the Schizopoda collected by H.M.S. "Challenger" during the years 1873-76. "Challenger" Reports, Zoology, xiii.
6. Tattersall, W. M. 1922. Indian Mysidacea, Rec. Ind. Mus., xxiv, pt. iv, p. 445-504, 28 text figs.
7. Walker A. O. 1898. Crustacea collected by W. A. Herdman in Puget Sound, Pacific Coast of North America, September, 1897, Proc. Trans. L'pool Biol. Soc., xii, p. 268-287.
8. Zimmer C. 1918. Neue und wenig bekannte Mysidaceen des Berliner Zoologischen Museums, Mitt. Zool. Mus. Berlin, ix, Hft. I, p. 13-26.